

RECEIVED  
CENTRAL FAX CENTER  
MAY 22 2008

U.S. Patent Application Serial No. 10/549,579  
Response to OA dated April 22, 2008

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (Cancel)

Claim 2 (Currently Amended): A drying apparatus ~~according to claim 1, for drying a subject,~~  
wherein a refrigerant is circulated through a compressor, a radiator, an expansion mechanism and  
an evaporator through pipes, said drying apparatus comprising:

a drying air flow path operable to introduce drying air heated by the radiator to the subject  
to be dried, dehumidify the drying air which has been introduced to the subject by using the  
evaporator, and, heat the dehumidified drying air to return it into the drying air;

a bypass circuit through which a portion of the drying air heated by the radiator flows to the  
evaporator without coming into contact with the subject to be dried;

~~further comprising~~ a bypass circuit flow rate detecting device operable to detect a flow rate  
of the drying air which flows into said bypass circuit; and

a bypass air flow rate adjusting device operable to adjust the flow rate of the drying air  
flowing into said bypass circuit using a value detected by said bypass circuit flow rate detecting  
device.

**RECEIVED**  
**CENTRAL FAX CENTER**  
**MAY 22 2008**

U.S. Patent Application Serial No. 10/549,579  
Response to OA dated April 22, 2008

Claim 3 (Currently Amended): A drying apparatus ~~according to claim 1, for drying a subject,~~  
wherein a refrigerant is circulated through a compressor, a radiator, an expansion mechanism and  
an evaporator through pipes, said drying apparatus comprising:

a drying air flow path operable to introduce drying air heated by the radiator to the subject  
to be dried, dehumidify the drying air which has been introduced to the subject by using the  
evaporator, and, heat the dehumidified drying air to return it into the drying air;

a bypass circuit through which a portion of the drying air heated by the radiator flows to the  
evaporator without coming into contact with the subject to be dried;

further comprising a super heat detecting device operable to detect super heat which is a  
difference between a refrigerant suction temperature of the compressor and a refrigerant evaporation  
temperature of the evaporator; and

a bypass air flow rate adjusting device operable to adjust a flow rate of drying air flowing into  
said bypass circuit using a value detected by said super heat detecting device.

Claim 4 (Currently Amended): A drying apparatus ~~according to claim 1, for drying a subject,~~  
wherein a refrigerant is circulated through a compressor, a radiator, an expansion mechanism and  
an evaporator through pipes, said drying apparatus comprising:

a drying air flow path operable to introduce drying air heated by the radiator to the subject  
to be dried, dehumidify the drying air which has been introduced to the subject by using the  
evaporator, and, heat the dehumidified drying air to return it into the drying air; and

U.S. Patent Application Serial No. 10/549,579  
Response to OA dated April 22, 2008

a bypass circuit through which a portion of the drying air heated by the radiator flows to the evaporator without coming into contact with the subject to be dried

wherein the drying air flowing through said bypass circuit heat-exchanges with a portion of the pipes which is located between the compressor and the evaporator.

Claim 5 (Currently Amended): A drying apparatus according to claim 1, for drying a subject, wherein a refrigerant is circulated through a compressor, a radiator, an expansion mechanism and an evaporator through pipes, said drying apparatus comprising:

a drying air flow path operable to introduce drying air heated by the radiator to the subject to be dried, dehumidify the drying air which has been introduced to the subject by using the evaporator, and, heat the dehumidified drying air to return it into the drying air;

a bypass circuit through which a portion of the drying air heated by the radiator flows to the evaporator without coming into contact with the subject to be dried;

further comprising a temperature detecting device operable to detect a temperature of the drying air dehumidified by the evaporator; and

a bypass air flow rate adjusting device operable to adjust a flow rate of the drying air flowing into said bypass circuit using a value detected by said temperature detecting device.

Claims 6-7 (Cancel)

**RECEIVED**  
**CENTRAL FAX CENTER**  
**MAY 22 2008**

U.S. Patent Application Serial No. **10/549,579**  
Response to OA dated April 22, 2008

Claim 8 (Currently Amended): A drying apparatus according to claim 7, for drying a subject, wherein a refrigerant is circulated through a compressor, a radiator, an expansion mechanism and an evaporator through pipes, said drying apparatus comprising:

a drying air flow path operable to introduce drying air heated by the radiator to the subject to be dried, dehumidify the drying air which has been introduced to the subject by using the evaporator, and, heat the dehumidified drying air to return it into the drying air; and

a bypass circuit through which a portion of the drying air heated by the radiator flows to the evaporator without coming into contact with the subject to be dried,

wherein said drying air flow path is provided with a refrigerant accommodating container operable to accommodate a refrigerant, and

wherein said refrigerant accommodating container is disposed in said drying air flow path at a location between a downstream portion of the radiator and an upstream portion of the evaporator.

Claim 9 (Currently Amended): A drying apparatus according to claim 1, for drying a subject, wherein a refrigerant is circulated through a compressor, a radiator, an expansion mechanism and an evaporator through pipes, said drying apparatus comprising:

a drying air flow path operable to introduce drying air heated by the radiator to the subject to be dried, dehumidify the drying air which has been introduced to the subject by using the evaporator, and, heat the dehumidified drying air to return it into the drying air; and

RECEIVED  
CENTRAL FAX CENTER  
MAY 22 2008

U.S. Patent Application Serial No. 10/549,579  
Response to OA dated April 22, 2008

a bypass circuit through which a portion of the drying air heated by the radiator flows to the evaporator without coming into contact with the subject to be dried,

wherein the compressor, radiator, and expansion mechanism are operated in a state in which a high pressure side thereof is in a supercritical state.

Claim 10 (Cancel)

Claim 11 (Currently Amended): A heat pump type drying apparatus ~~according to claim 10,~~  
further comprising:

a heat pump having a compressor, a radiator, an expansion mechanism and an evaporator connected via pipes through which a refrigerant is circulated;

a drying air flow path operable to introduce drying air heated by said radiator to a subject to be dried, dehumidify the drying air which has been introduced to the subject by using said evaporator, and heat the dehumidified drying air to return it into the drying air;

a bypass circuit through which a portion of the drying air heated by said radiator flows to said evaporator without coming into contact with the subject to be dried;

a bypass circuit flow rate detecting device operable to detect a flow rate of the drying air which flows into said bypass circuit; and

a bypass air flow rate adjusting device operable to adjust the flow rate of the drying air flowing into said bypass circuit using a value detected by said bypass circuit flow rate detecting device.

**RECEIVED**  
**CENTRAL FAX CENTER**  
**MAY 22 2008**

U.S. Patent Application Serial No. 10/549,579  
Response to OA dated April 22, 2008

Claim 12 (Currently Amended): A heat pump type drying apparatus according to claim 10,  
further comprising:

a heat pump having a compressor, a radiator, an expansion mechanism and an evaporator connected  
via pipes through which a refrigerant is circulated;

a drying air flow path operable to introduce drying air heated by said radiator to a subject to  
be dried, dehumidify the drying air which has been introduced to the subject by using said  
evaporator, and heat the dehumidified drying air to return it into the drying air;

a bypass circuit through which a portion of the drying air heated by said radiator flows to said  
evaporator without coming into contact with the subject to be dried;

a super heat detecting device operable to detect super heat which is a difference between a  
refrigerant suction temperature of said compressor and a refrigerant evaporation temperature of said  
evaporator; and

a bypass air flow rate adjusting device operable to adjust a flow rate of drying air flowing into  
said bypass circuit using a value detected by said super heat detecting device.

Claim 13 (Currently Amended): A heat pump type drying apparatus according to claim 10,  
comprising:

a heat pump having a compressor, a radiator, an expansion mechanism and an evaporator  
connected via pipes through which a refrigerant is circulated;

a drying air flow path operable to introduce drying air heated by said radiator to a subject to  
be dried, dehumidify the drying air which has been introduced to the subject by using said

U.S. Patent Application Serial No. 10/549,579  
Response to OA dated April 22, 2008

evaporator, and heat the dehumidified drying air to return it into the drying air; and

a bypass circuit through which a portion of the drying air heated by said radiator flows to said evaporator without coming into contact with the subject to be dried,

wherein the drying air flowing through said bypass circuit heat-exchanges with a portion of said pipes which is located between said compressor and said evaporator.

Claim 14 (Currently Amended): A heat pump type drying apparatus according to claim 10; further comprising:

a heat pump having a compressor, a radiator, an expansion mechanism and an evaporator connected via pipes through which a refrigerant is circulated;

a drying air flow path operable to introduce drying air heated by said radiator to a subject to be dried, dehumidify the drying air which has been introduced to the subject by using said evaporator, and heat the dehumidified drying air to return it into the drying air;

a bypass circuit through which a portion of the drying air heated by said radiator flows to said evaporator without coming into contact with the subject to be dried;

a temperature detecting device operable to detect a temperature of the drying air dehumidified by said evaporator; and

a bypass air flow rate adjusting device operable to adjust a flow rate of the drying air flowing into said bypass circuit using a value detected by said temperature detecting device.

**RECEIVED  
CENTRAL FAX CENTER**

**MAY 22 2008**

U.S. Patent Application Serial No. 10/549,579

Response to OA dated April 22, 2008

Claims 15-16 (Cancel)

Claim 17 (Currently Amended): A heat pump type drying apparatus ~~according to claim 16;~~

comprising:

a heat pump having a compressor, a radiator, an expansion mechanism and an evaporator  
connected via pipes through which a refrigerant is circulated;

a drying air flow path operable to introduce drying air heated by said radiator to a subject to  
be dried, dehumidify the drying air which has been introduced to the subject by using said  
evaporator, and heat the dehumidified drying air to return it into the drying air;

a bypass circuit through which a portion of the drying air heated by said radiator flows to said  
evaporator without coming into contact with the subject to be dried.

wherein said heat pump type drying apparatus further comprises:

a refrigerant accommodating container disposed in the drying air flow path to accommodate  
a refrigerant.

wherein said refrigerant accommodating container is disposed in said drying air flow path  
at a location between a downstream portion of said radiator and an upstream portion of said  
evaporator.

Claim 18 (Currently Amended): A heat pump type drying apparatus ~~according to claim 10;~~

comprising:

a heat pump having a compressor, a radiator, an expansion mechanism and an evaporator



U.S. Patent Application Serial No. 10/549,579  
Response to OA dated April 22, 2008

connected via pipes through which a refrigerant is circulated;

a drying air flow path operable to introduce drying air heated by said radiator to a subject to be dried, dehumidify the drying air which has been introduced to the subject by using said evaporator, and heat the dehumidified drying air to return it into the drying air; and

a bypass circuit through which a portion of the drying air heated by said radiator flows to said evaporator without coming into contact with the subject to be dried,

wherein said heat pump is operated in a state in which a high pressure side thereof is in a supercritical state.

Claims 19 - 21 (Cancel)

Claim 22 (Previously Presented): A drying method for drying a subject located within a circuit, said drying method comprising:

dehumidifying and heating air to obtain drying air having a high temperature and low moisture;

passing a portion of the drying air through the circuit to bring the portion of the drying air into contact with the subject; passing another portion of the drying air through a bypass circuit, the bypass circuit being arranged to avoid the another portion of the drying air from coming into contact with the subject;

mixing the portion of the drying air brought into contact with the subject and the another portion of the air passed through the bypass circuit to obtain the air;

**RECEIVED**  
**CENTRAL FAX CENTER**

**MAY 22 2008**

U.S. Patent Application Serial No. **10/549,579**  
Response to OA dated April 22, 2008.

adjusting a flow rate of the drying air which is passed through the bypass circuit; and  
detecting a temperature of the air after it is dehumidified and controlling said adjusting the  
flow rate of the drying air which is passed through the bypass circuit by using the detected  
temperature.